GP1S36

Photointerrupter for Detecting Tilt Direction

■ Features

1. Subminiature (4.0×4.2×3.8mm)
   (with built-in super compact ball for detecting tilt direction)
2. 2-phase output type
3. Able to detect the tilt direction of both side (±90°) by the position of rolling ball.
4. High reliability due to non-contact structure

■ Applications

1. Digital cameras
2. Camcoders

■ Absolute Maximum Ratings

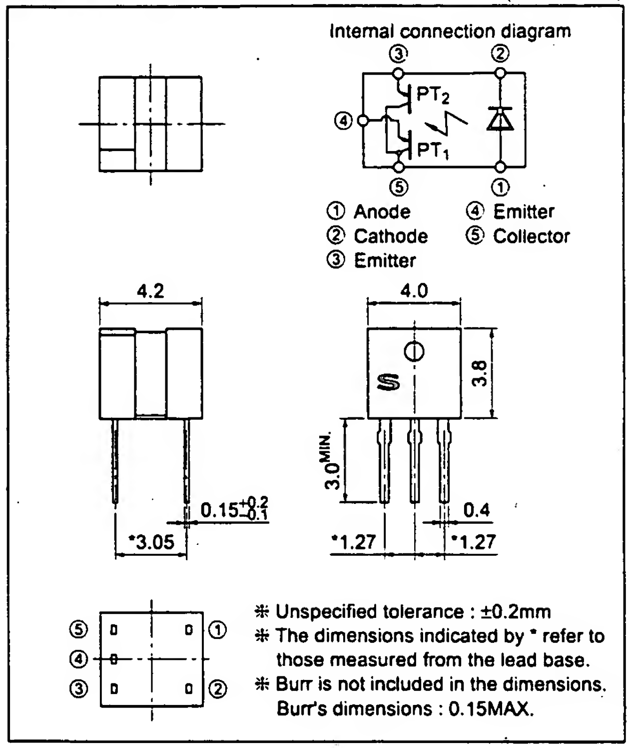
(Ta=25°C)

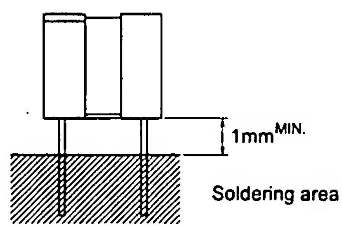
	Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
Input	Reverse voltage	V_R	6	V
Input	Power dissipation	P	75	mW
Output	Collector-emitter voltage	V_{CE_1O}, V_{CE_2O}	35	V
Output	Emitter-collector voltage	V_{E_1CO}, V_{E_2CO}	6	V
Output	Collector current	I_C	20	mA
Output	Collector Power dissipation	P_C	75	mW
	Total power dissipation	P_{tot}	100	mW
	Operating temperature	T_{opr}	−25 to +85	°C
	Storage temperature	T_{stg}	−40 to +100	°C
	*1 Soldering temperature 1	T_{sol}	260	°C
	*2 Soldering temperature 2	T_{sol}	320	°C

*1 For MAX. 5s
*2 For MAX. 2s at the position of 0.8mm from the bottomface of resin package by hand soldering.

■ Outline Dimensions

(Unit : mm)





■ Electr - ptical Characteristics

(Ta=25°C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	I_F=20mA	-	1.2	1.4	V
	Reverse current		I_R	V_R=3V	-	-	10	μA
*3 Output	Collector dark current		I_{CEO}	V_{CE}=20V	-	-	100	nA
*3 Coupling Characteristics	Collector current		I_C	V_{CE}=5V, I_F=5mA	60	-	360	μA
	*4 Leak current		I_{LEAK}	V_{CE}=5V, I_F=5mA			15	μA
	Response time	Rise time	t_r	V_{CE}=5V, I_C=100μA	-	50	150	μs
		Fall time	t_f	R_L=1 000Ω	-	50	150	μs
	Collector-emitter saturation voltage		$V_{CE(sat)}$	I_F=10mA, I_C=60μA	-	-	0.4	V

*3 Output and coupling characteristics are common to the both phototransistors.
*4 Characteristics except leak current is measured at θ=0°, ϕ=0°.
Leak current is the output current of transistor when θ=±90°, ϕ=0° and IC=OFF.

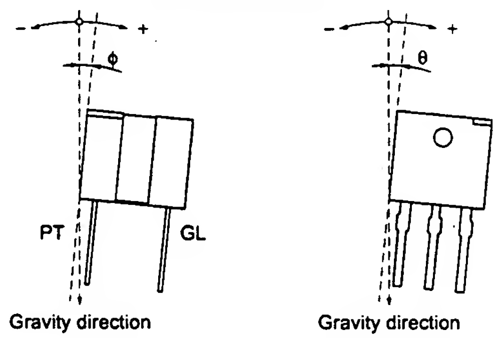
■ Detecting Angle Characteristics

θ	-90°	↔	-75°	↔	-15°	↔	+15°	↔	+75°	↔	+90°
I_{C1}	ON							*5	OFF		
I_{C2}	OFF			*5	ON						

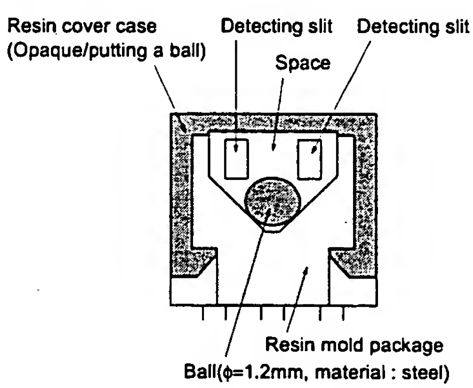
⁜ Conditions : I_F=5mA, VCC=5V, ϕ<=±5°
*5 Indefinite

I_{C1} : Output current of phototransistors PT_1
I_{C2} : Output current of phototransistors PT_2
θ : Device condition : Refer to the figure
ϕ : Device condition : Refer to the figure
ON :Output current of phototransistors : 60μA or more
OFF : Output current of phototransistors : 15μA or less
⁜ Output current of ON/OFF is output when device is at a standstill

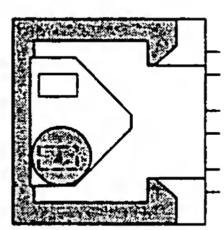
Device state diagram



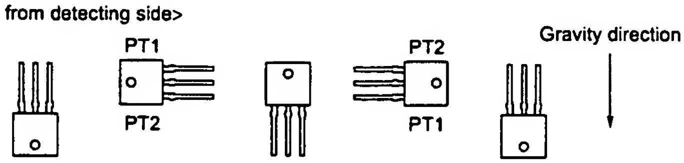
■ Supplement



<90°rotation>



<Viewing from detecting side>



PT1 output	Indefinite	(ON)	(ON)	(OFF)	Indefinite
PT2 output	Indefinite	(OFF)	(ON)	(ON)	Indefinite

PT : Detecting (white)
PT : Opaque (black)
PT : Indefinite (dotted)

Fig.1 F rward Current vs. Ambient Temperature

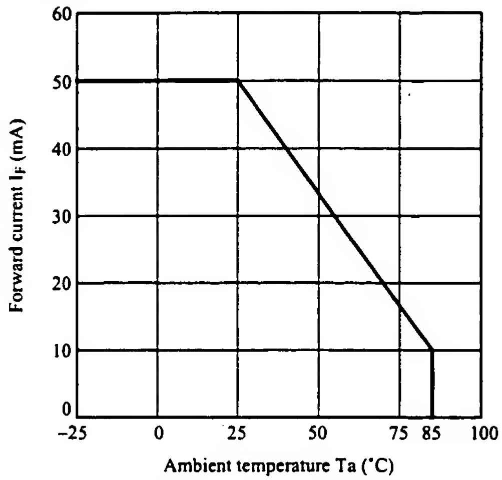


Fig.2 Power Dissipation vs. Ambient Temperature

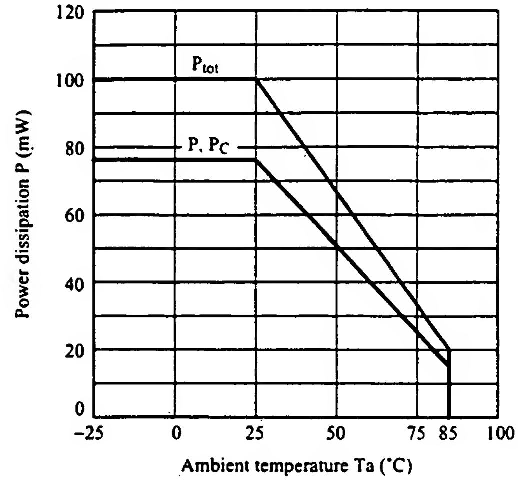


Fig.3 Forward Current vs. Forward Voltage

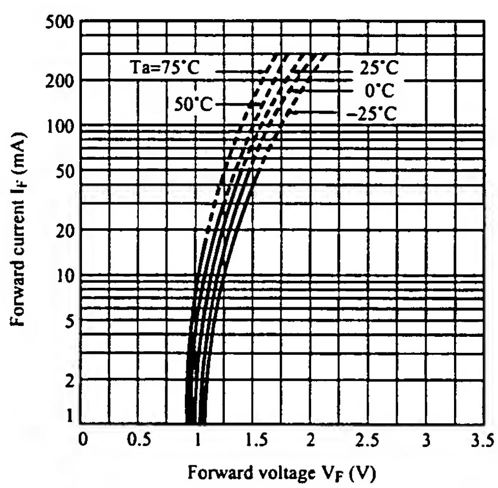


Fig.4 Collector Current vs. Forward Current

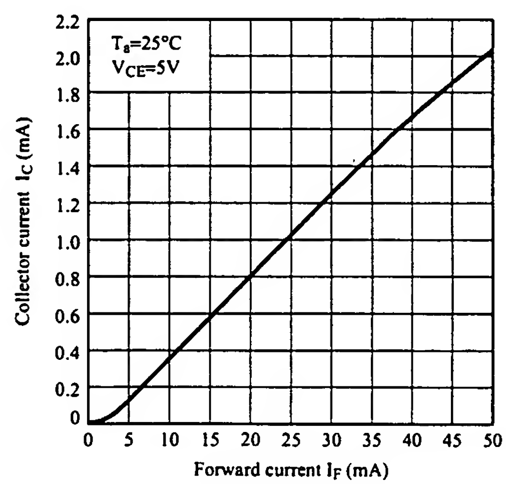


Fig.5 Collector Current vs. Collector-emitter Voltage

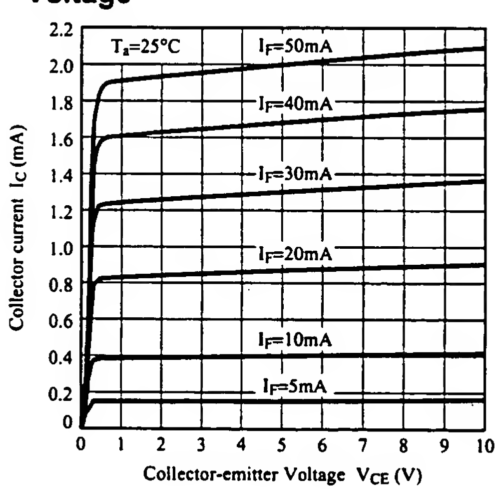


Fig.6 Relative Collector Current vs. Ambient Temperature

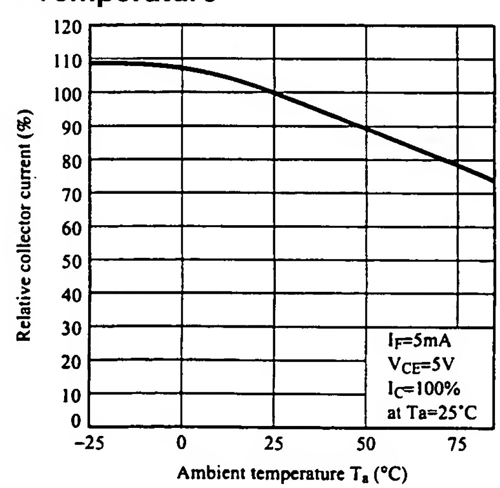


Fig.7 Collect r-emitter Saturati n Voltage vs. Ambient Temperature

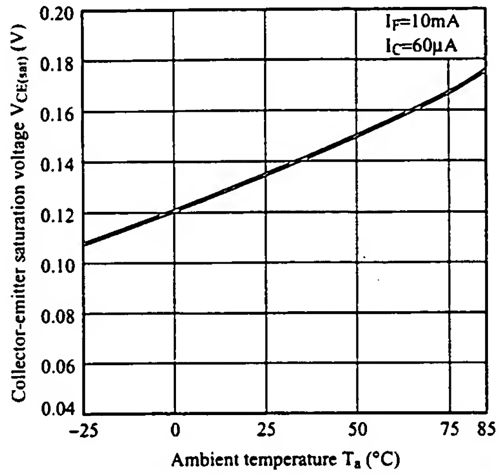


Fig.8 Resp nse Time vs. Load Resistance

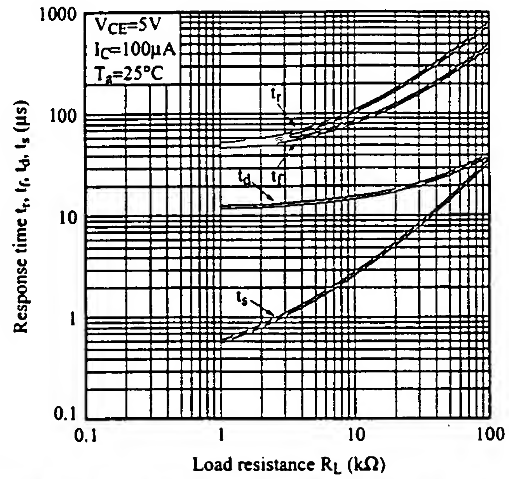


Fig.9 Collector Dark Current vs. Ambient Temperature

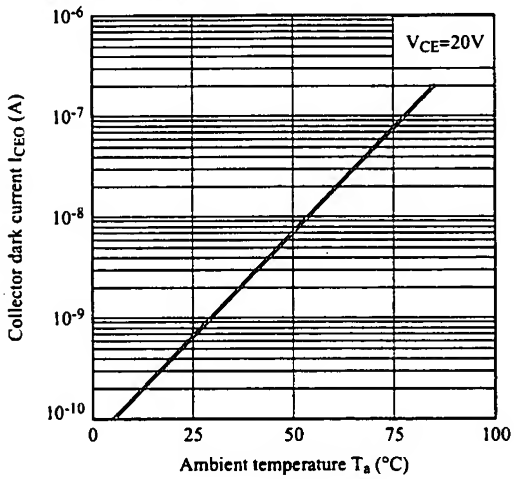
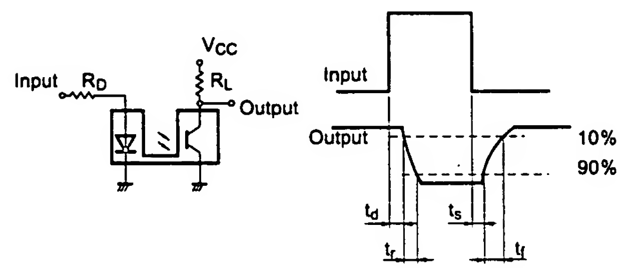


Fig.10 Test Circuit for Response Time



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- Office automation equipment
- Telecommunication equipment [terminal]
- Test and measurement equipment
- Industrial control
- Audio visual equipment
- Consumer electronics

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